

Remarks/Arguments:

Claims 1, 2, and 4-8 are presently pending. Applicants herein amend claim 1. Applicants herein add new claims 9-14. Reconsideration is respectfully requested in view of the above amendments and the following remarks.

Claim Rejections Under 35 U.S.C. 103

Claims 1-8 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Haniya et al. (US Pub. 2004/0261562) in view of Takayanagi (JP 408057648A). It is respectfully submitted, however, that the claims are patentable over these references for the reasons set forth below.

Applicants' invention, as recited by claim 1, includes a feature which is neither disclosed nor suggested by the art of record, namely:

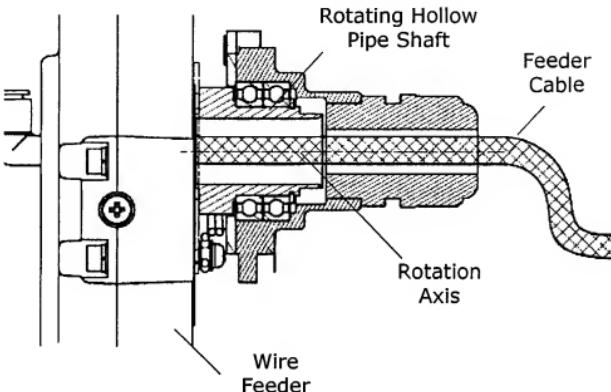
a wire feeder provided to the second arm and being rotatable around a rotation axis...

wherein the rotation axis is composed of a rotating hollow pipe shaft having a first end and a second end opposite the first end, and the feeder cable passes through the rotating hollow pipe shaft from the first end to the second end.

The wire feeder rotates around a rotating hollow pipe shaft. The feeder cable passes from one end of the hollow pipe shaft to the opposite end. This feature is found in the originally filed application at page 6, lines 19-24, and FIG. 3. No new matter has been added.

Applicants' FIG. 3 (reproduced below) illustrates an exemplary embodiment of the present invention including the above-described features of claim 1.

FIG. 3



As illustrated in FIG. 3, the wire feeder is rotatable around a rotation axis. The rotation axis includes a rotating hollow pipe shaft. The feeder cable passes in one end of the rotating hollow pipe shaft and out the other end, where it is coupled to the wire feeder.

Haniya is directed to an industrial robot. As illustrated in FIGS. 1 and 2, for example, Haniya discloses an industrial robot mounted on a base stand 1. A turning base 2 is mounted to the base stand 1. A lower arm 3 is supported on the turning base 2. An upper arm 4 is pivotably mounted on the lower arm 3. A wrist portion 5 is rotatably attached to the end of upper arm 4. Wrist portion 5 is rotatable around the R-axis. Haniya further discloses a wire feeding unit 11 fixed to the rear portion of upper arm 4. See Haniya at paragraphs [0033]-[0035] and FIGS. 1 and 2.

Takayanagi is directed to a welding robot. As illustrated in FIGS. 1 and 2, for example, Takayanagi discloses a welding robot having a wire feeding device 7. Feeding device 7 is attached to a third arm 33 of the robot using a movable base 76. As illustrated in FIG. 3,

movable base 76 can be rotated around shaft 74. See Takayanagi at paragraph [0074]. See Takayanagi at paragraph [0014]; also compare wire feeder 7 in FIG. 1 with wire feeder 7 in FIG. 2.

The Office Action recites that Haniya discloses wire feeding unit 11 "being rotatable around a rotation axis (see R-axis rotation in figure 1)." Applicants respectfully disagree. Haniya discloses that wrist portion 5 is rotatable around the R-axis relative to upper body 4. See Haniya at paragraph [0034] and FIG. 1. Regarding wire feeding unit 11, Haniya discloses that wire feeding unit 11 is fixed to a rear end of upper body 4. See Haniya at paragraph [0033], and FIG. 2. Haniya fails to disclose or suggest wire feeding unit 11 being rotatable.

Further, the Office Action recites that Haniya discloses "the feeder cable passes through the rotating hollow pipe shaft." Applicants respectfully disagree. Haniya discloses that conduit cable 12 passes from wire feeding unit 11 into the interior of body 6 of wrist portion 5 along the R-axis. See Haniya at paragraphs [0043]-[0044]. However, as described above, the R-axis is a rotation axis for wrist portion 5, and not for wire feeding unit 11. Haniya fails to disclose that the interior of body 6 composes a rotation axis of the wire feeding unit 11. Thus, Haniya fails to disclose or suggest cable conduit 12 passing through a rotation axis of wire feeding unit 11.

Applicants respectfully submit that Takayanagi fails to make up for the deficiencies of Haniya with respect to claim 1. As described above, Takayanagi disclose that feeding device 7 is mounted on movable base 76, which rotates around shaft 74. Takayanagi fails to disclose or suggest that shaft 74 is a hollow pipe shaft. Further, Takayanagi discloses a feeding pipe 6 separate from shaft 74. Takayanagi fails to disclose that the feeding pipe 6 passes through shaft 74.

The above references are different from the claimed invention because claim 1 requires that the wire feeder is rotatable around a rotation axis composed of a hollow pipe shaft. Neither Haniya nor Takayanagi discloses a wire feeder rotatable around a hollow pipe shaft. Further, the above references are different from the claimed invention because claim 1 requires that the feeder cable passes through the hollow pipe shaft. Neither Haniya nor Takayanagi discloses the feeder cable passing through a hollow pipe shaft.

Accordingly, Haniya in view of Takayanagi fails to disclose, teach, or suggest "a wire feeder...being rotatable around a rotation axis...composed of a rotating hollow pipe shaft having

a first end and a second end opposite the first end, and the feeder cable passes through the rotating hollow pipe shaft from the first end to the second end," as recited in claim 1.

It is because Applicant includes the feature of a wire feeder rotatable around a rotation axis composed of a rotating hollow pipe shaft, and a feeder cable passing through the rotating hollow pipe shaft, that the following advantages are achieved. "With such a structure, even when feeder 16 is rotated, layout of cable 22 inside shaft 21 constituting rotation axis 17A is not affected.... Therefore, workability associated with the change between the floor-mounted use and the ceiling-mounted use of the industrial robot can be improved." See the originally filed application at page 7, lines 15-23.

Accordingly, for the reasons set forth above, claim 1 is patentable over the art of record.

Claims 2 and 4-8 include all features of claim 1 from which they depend. Thus, claims 2 and 4-8 are also patentable over the art of record for the reasons set forth above.

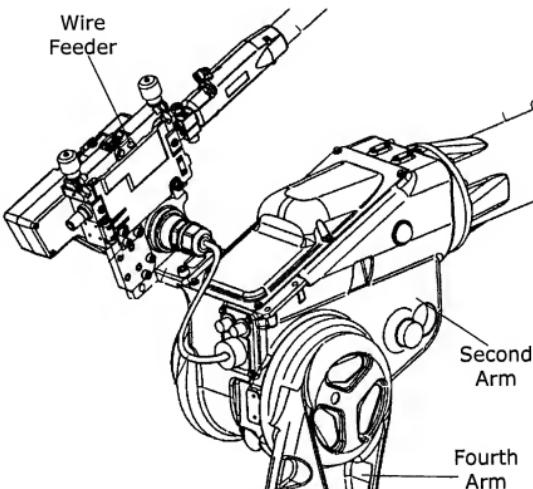
Applicants respectfully submit that claim 8 includes additional features which are neither disclosed nor suggested by the art of record, namely:

the fourth arm is attached to one side face of the first arm and one side face of the second arm, and the wire feeder is located opposite to the fourth arm relatively to a rotating axis of the first arm.

The fourth arm is attached to one side of the second arm. The wire feeder is provided to the second arm such that it is opposite to the fourth arm relative to axis of rotation of the first arm.

Applicants' FIG. 4 (reproduced below) illustrates an exemplary embodiment of the present invention including the above-described features of claim 8.

FIG. 4



As illustrated in FIG. 4, the fourth arm is attached to one side of the second arm. The wire feeder is provided on the opposite side of the second arm, relative to the axis of rotation which passes through the first arm (parallel to the axis of rotation of the second arm).

The Office Action recites that Haniya discloses "the wire feeder 11 (fig. 2) is located opposite to the fourth arm relatively to a rotating axis of the first arm." Applicants respectfully disagree. Haniya discloses that wire feeding unit 11 is "fixed to a rear end of upper arm 4." See Haniya at paragraph [0035] and FIG. 1. Haniya fails to disclose or suggest wire feeding unit 11 is provided on a side opposite the lower arm 3. This is different from the claimed invention because claim 8 requires that the wire feeder be located opposite the fourth arm relative to a rotating axis of the first arm. Accordingly, Haniya in view of Takayanagi fails to

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disclose, teach, or suggest "the wire feeder is located opposite to the fourth arm relatively to a rotating axis of the first arm," as recited in claim 8.

It is because Applicant includes the feature of the wire feeder located opposite to the fourth arm relative to a rotating axis of the first arm that the following advantages are achieved. "[W]hen feeder 16 is attached to the opposite side to fourth arm 13 relatively to the rotating axis of first arm 12, problems associated with interference...or unnecessary increase in the size and weight of fixing device 17 do not arise. Therefore, deterioration of the motion performance and approaching performance to a welding work, etc. in an industrial robot can be prevented." See the originally filed application at page 6, lines 13-18.

Accordingly, for the reasons set forth above, claim 8 is patentable over the art of record.

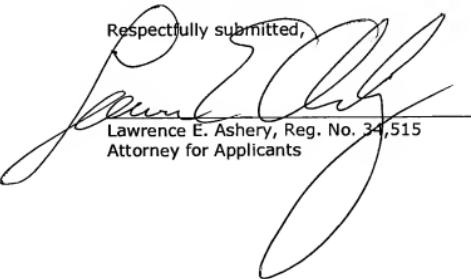
New Claims 9-14

Applicants herein add new claims 9-14. Independent claim 9 substantially corresponds to claim 8, rewritten in independent form. Claim 9 includes the feature of "the wire feeder is located opposite to the fourth arm relatively to a rotating axis of the first arm" described above with respect to claim 8. Therefore, Applicants respectfully submit that claim 9 is patent over the art of record for at least the reasons discussed above with respect to claim 8.

Claims 10-14 include all features of claim 9 from which they depend. Thus, claims 10-14 are also patentable over the art of record for the reasons set forth above.

In view of the amendments and arguments set forth above, the above-identified application is in condition for allowance, which action is respectfully requested.

Respectfully submitted,


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